DOCUMENT RESUME

ED 412 213 SP 037 596

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TITLE	From Pedagogy through Andragogy to Holosagogy.
PUB DATE	1997-07-00
NOTE	18p.
PUB TYPE	Opinion Papers (120)
EDRS PRICE	EDRS Price MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Adult Education; Adult Learning; *Andragogy; Cognitive Processes; *Cognitive Style; Context Effect; Diversity (Student); *Educational Theories; Elementary Secondary Education; Higher Education; *Holistic Approach; *Instruction; Intelligence
IDENTIFIERS	*Brain Based Learning; *Multiple Intelligences

ABSTRACT

"Holosagogy" is proposed as a new, complete system of learning and teaching that applies to teachers and learners of all ages, cultures, and disciplines in all educational settings. The first section of the paper discusses facts about the human brain and explains why educators must understand and respect how the brain works to perceive, process, store, and retrieve information so they will not inhibit learning with brain antagonistic teaching, administration, and organizational practices. The second section examines human modalities, learning styles, and intelligences, explaining that all students learn in different ways and have intelligences and strengths in different areas. The third section discusses the component of community, an important cornerstone for the holosagistic paradigm. Meaningfulness can only be measured in the context of the individual's learning community. Educators cannot expect earlier systems of teaching to respond adequately to a culturally diverse, information-based society and its educational needs. Holosagogy can celebrate and accommodate great diversity and developmental learning patterns, both biological and environmental, of all individuals. (Contains 23 references). (SM)

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ED 412 213

FROM PEDAGOGY THROUGH ANDRAGOGY TO HOLOSAGOGY

For many educators, the pedagogical paradigm for teaching and learning is the preferred model. The first endowed chair of pedagogy for the training of teachers was established at the University of Halle in Germany in 1779[1] and translated to American educational institutions with little opposition. Andragogy and its postulates on how adults learn has been known in professional educational circles since Kapp (a German) first used the term in 1883.[2] Eduard Lindeman introduced the concept into the United States in the 1920s.[3] Most individuals in America trace their exposure to the concept over the past few decades to such authors as Knowles, Tough, Cross and others.[4] Knowles popularized the term and proposed a set of assumptions (based on Linderman) to which many others, such as Tough, and Cross, responded and expanded upon.

But many of the followers of the andragogical movement would agree that it differentiates from pedagogy in that it assumes that as individuals mature: 1) a learner's self-concepts move from a dependency mode to one of independence or self-directedness, 2) the learner's own experiences become greater, and thus a resource, or "reservoir" for learning expands, 3) life roles and there resulting developmental tasks become dominate, and 4) immediacy of application versus a postponement of the application of knowledge controls the subject matter.

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Knowles saw andragogy as "simply another model of assumptions about learners."[5] This statement would hold true for some newer paradigms within the field of adult education such as self-directed learning, situated cognition, and critical pedagogy. Indeed, each of the above assumptions and models used with adult learners can be applied to some degree to those who for whatever reason are not classified on an age spectrum as adults. Of course, we all know that such a chronological classification will vary greatly on who is making the decision, the legal statute being cited, and more importantly the maturity level of the individual being classified. Toll[6] assures us that, "Chronological age alone is insufficient as a descriptor or determinant." This author agrees with Toll when he goes on to say, "Researchers have defined adulthood by biological, social, psychological, and existential age." In short, any or all of the base assumptions as to what is commonly referred to as andragogy can and have been utilized with learners of various ages, dependent upon the unique qualities and maturity of the learner in question. Therefore, it is not just the factor of age, or other earlier accepted pedagogical or andragogical assumptions, which should be dominant in the professional educator's thinking but rather how each individual can and prefers to learn.

A new formula for education was not available a hundred years ago when andragogy was first introduced in this country by Lindeman or even thirty years ago when the concept was made popular by Knowles and others. It most assuredly was not available in 1779

when pedagogy was recognized in the German university system. What is proposed in this manuscript is a new system of learning and teaching that applies to learners of all ages, all cultures, for all disciplines, and in all educational settings. Although the components of this new model are widely known and have been successfully implemented, few, if any, attempts at combining these elements into a coherent theory of teaching and learning have been attempted. This manuscript boldly attempts to outline just such a new paradigm for learning. And to distinguish it from earlier models of pedagogy and andragogy this author terms this model holosagogy, i.e. a combination of the Greek words *holos* meaning *a complete system*, or whole in English, and *agogos* or *leader*. **Holosagogy**, silent "s", and pronounced whole-a-gogy, **is a complete system for leaders of teaching and learning.** Knowing full well that this American/Greek creation may violate the normal methods of forming compounds in Greek, it is still offered to delineate this new paradigm or model.

It All Begins and Ends With the Brain

Hippocrates suggested that the brain was the organ of the mind.[7] Yet, few educators can honestly say they have ever been exposed to how the mind works. This author knows of no college of education, corporate training center, or non-profit educational agency that requires its current or future educational leaders to take training in the anatomy and physiology of the brain. Although

considered "the most intricate apparatus we know of in the universe,"[8] and its study the key to all future teaching and learning, we painfully cling to concepts that agonize both teachers and the learners.

The professional educator's continuing goal must be to learn from those cognitive researchers and neuroscientists who are daily expanding our knowledge base of how the brain perceives, processes, stores, and retrieves information. Caution should be exercised when extrapolating information from these scientists. For an understanding of how the brain works to how it can best be taught remains a thin bridge to be walked carefully. But given the knowledge base available, we must attempt to eliminate all brain antagonistic teaching, administrative, and organizational practices that inhibit learning. For the first time in history neurobiologists can now look directly into the processing abilities of humans as they occur with the use of the functional magnetic resonance imaging (FMRI), the positron emission tomography (PET), the nuclear magnetic resonance imager (NMR), electroencephalograms (EEG), the magneto-encephalography (MEG), the superconducting quantum interference device (SQUID) which locates small magnetic fields in the brain, or brain electrical activity mapping (BEAM) which uses color gradations to represents graphic representations of the cerebral cortex, as well as spectrometers devices that measures specific brain chemicals as activity is occurring. No longer do we have to defer to psychologists who have historically

studied lower life forms, abnormal behavior, or brain injured individuals in the hope of obtaining translatable information which might be applied to normal human learning. Their belief systems and theories of learning became what we now carry as the dominate rationale for current educational methodologies and classroom organizational structure. Such systems grew into philosophies of education and many classroom practices can be traced to old (1779,1883) theories of learning developed from the observation and experimentation on rats, pigeons, dogs, and lizards. At best, most of these animal conditioning generalizations were inaccurate, partial, or valid only at the cellular level. They were, and are, too limited for application to the most complex learning machine the universe has ever seen--the human brain.[9]

Some of the human brain facts that are now available to us include: 1) human intelligence is not fixed--uses more than genetics is what counts, 2) each brain has an estimated 100 billion neural cells capable of creating trillions of connections--more possible interconnections than the number of atoms in the universe,[10] 3) it is a pattern detecting mechanism whose overwhelming need is for meaningfulness--it is not passive, 4) the human brain is indisputably a multipath, multimodel apparatus--it hates mandatory or fixed sequences, 5) it can process about one trillion bits per second--and gets bored when having little to do,[11] 6) the physical structure of the brain changes as a result of new experiences--experiences shape our brains, and then our brains

shape our experiences,[12] and 7) under stress, the indexing capacities of the brain are deduced--downshifting brings on a sense of helplessness.[13] These and many more "human" learning facts which are now available to the professional educator must constitute the basis for any new model of teaching and learning. In short, the human brain's powerful cerebral cortex, which allows you the reader to understand these printed symbols, think higher order thoughts, and envision a better future for education is virtually non-existent in lower life forms. Any attempt to equate human learning with any other life form, or vice versa, at best constitutes speculation. Therefore, any new model of teaching and learning must not violate these and other facts that are now available on how the human brain functions. The following is a brief discussion of some brain compatible educational approaches and practices which complement each other and have been proven to have great merit on their own. I leave each component of holosagogy to defend itself for they each have their own research base, demonstration sites, professional associations, noted authors, and a wealth of literature.

Human Modalities, Learning Styles, and Intelligences

The human brain is the largest, relative to body size, of all land mammals,[14] but just where it is large is what should concern educators. The cerebral cortex, the "executive branch" [an Ornstein term], or the most upper part of the brain contains more nerve

cells than all the rest of the brain put together,[15] and it is what carries us beyond our genetic inheritance. In it there is a physical auditory area, a sensory area, and a visual area. While researchers probably know most about the visual sheet of the cortical tissue at the back of the brain that codes visual input, it is these modalities (visual, auditory, touch or tactile/kinesthetic) which provide the stimulus for learning.

Many educators are surprised to learn that most students are not auditory. That is, they rarely can remember three quarters of what they hear in a normal 40-50 minute class period. Any educational delivery system that centers primarily on lectures, class discussions, and talking are often the least effective ways to teach.[16] Only 30 percent of the general population is auditory, 40 percent are visual, and 15 percent are tactile, with kinesthetic learners continuing to prefer to move and use their bodies when learning. Perhaps Dr. Rita Dunn, Director of the Learning Styles Network at St. John's University, summarized this concern best when she said, "Nothing is more unequal than treating individuals as though they were equal in all ways." The Dunns advocate approaching all learners through multisensory approaches, but initially through their most preferred modality and then providing reinforcement through their secondary or tertiary modality. Only by doing so can the professional educator accommodate the biological and developmental nature of each learner's preferred modalities. Individualized modality sensitive learning versus

group instructional practices becomes one of the cornerstones for a new learning paradigm.

It is not that the learner can't learn through other modalities, since all humans have all senses, its just easier--more natural to use their preferred modalities. To appreciate this point, please take a moment to sign your name on a piece of paper. Now sign your name with your other hand. Reflectively use some words to describe how it felt to use your other hand. Do such words as: uncomfortable, elementary, clumsy, takes more concentration, and embarrassing capture the essence of this experience. Now consider the ramifications of asking/requiring a student to learn something new and difficult and not allowing them to use their preferred modalities of learning. Although they, and their brains, can and probably will accommodate you, they too have the same feelings as you did when signing your name with your opposite hand. For many learners this "uncomfortable" feeling is with them day after day when instruction is being presented to them in their opposite modalities.

Learning styles include learning modalities plus a whole lot more. Although there are over two dozen "learning style" instruments in circulation, this author prefers the learning styles model as designed by Rita and Ken Dunn, for it looks at the major elements that affect learning, i.e.: environmental, emotional, sociological, psychological, and physical. Environmental elements

include; sound, light, temperature, and design. Emotional elements include; motivation, persistence, responsibility, and structure. Sociological elements include; preference for self study, study in pairs, with peers, in a team, with adults, or a varied approach. Psychological elements, include; global, analytic, hemisphericity, impulsiveness or reflectiveness. While physical elements, in addition to the four perceptual modalities (visual, auditory, tactual, kinesthetic), include food intake, time of day, and mobility needs. Knowing which of the twenty plus learning style elements a person has a strong preference for can provide any age learner with valuable information as to how, when, where, and under what conditions they learn best, as well as how to match their learning needs and preferences with instructors. DeBello tells us, "learning style is the way people absorb, process, and retain information."[17] He goes on to assure us that "much of learning style is biologically imposed on humans, and we can no sooner change our styles than can we permanently change the color of our eyes, hair, or skin." It has been reported that up to three-fifths of the Dunn and Dunn Learning Style Model elements are "genetically imposed."[18] In short, a human's learning style is as individual as their signature. Once again this is in congruence with the unique neuron networking of each human brain. It cries out for diversity in teaching and learning versus the continuance of uniform approaches and delivery systems based on earlier assumptions about learning and teaching.

Howard Garner and a team of researchers at Harvard University helped define the theory of multiple intelligences and it has attracted the attention of educators for over a decade. The fact is that all humans, irrespective of age, gender, or culture have seven or eight identifiable intelligence, or proclivities, for learning. This fact does not fit well with educators, or educational systems, that are dependents of Alfred Binet's paper-pencil bell curve/intelligences testing. No longer can the linguistic, and logical-mathematical intelligences (I.Q., SAT, GED.) be given preferential treatment over musical, spatial, bodily-kinesthetic, interpersonal, intrapersonal, and natural intelligences. These newly recognized human potentials or "intelligences" again speak to the need to celebrate the diversity in all learners. Such findings support other authors such as Leslie Hart who assures us that "instruction that recognizes and is compatible with the natural brain functions will go far faster and be vastly more successful."[19]

The Component of Community

The fourth cornerstone for the new holosgistic paradigm to learning addresses the brain's need for meaningfulness. As noted earlier, the brain is a pattern detecting apparatus. It wants to make sense out of the input that it is receiving through its senses. To do so, it is constantly processing input and trying to match it to earlier learned behavior. Cermak and Craik[20] feel

meaningful information is processed at a deeper level in long term memory, thus retrieval and remembering is easier for the learner.

Klapp[21] reported that boredom may result from the brain's attempt to process meaningless information. In short, sense is easier to process and remember than nonsense. When the learner's brain is unable to link new information (input) to its reservoir of stored experiences (memory) it does not learn--or more accurately, it can't learn as easily. The brain must physically build new dendrite patterns for storage. In short, no link--no learn. And the further instruction gets away from reality, the learner's real life, the more difficult it is for the learner to find, or build, meaning. Asking the learner to make sense out of symbolic experiences, generalizations, theoretical principals, and isolated fragments of information goes against the natural learning paths of the brain. Unfortunately, most of formal education as we know it is detached from the real life roles of the learner. Caine[22] goes even further and says, "By ignoring the personal world of the learner, educators actually inhibit the effective functioning of the brain."

Unfortunately, this is the case when artificial classroom experiences are favored over the rich learning environments of our communities. Educators continue to suffer from "edifice complex" (a Knowles term) or the belief that respectable education only takes place in buildings or one's institutional campuses. The only

way we can ever hope to allow the brain to use its natural learning capacity is to use not only symbols and classrooms but also the rich meaningful sensory experiences of the learner's community. Meaningfulness and patterns will naturally occur when instruction relates to the life roles (vocational, avocational, personal development, community or civic, and spiritual) of the learner. This is best done while employing community resources (business/industry, non-profit agencies, geographic, and people of all ages and cultures).

This requires a shift from teaching of isolated and fragmented bits of information, which the brain has a difficult time remembering without getting bored to an expanded use of natural knowledge bases. Marian Diamond, Professor of Anatomy at the University of California-Berkeley states, "a positive, nurturing, stimulating environment that encourages interaction and response are the prime conditions for the development of complex neural networks that appear to be the "hardware" of intelligence."[23] Those stimulating environments can be designed for the classroom, but, they naturally occur in the learner's communities. The educators task then becomes more than instruction it rather becomes helping people be more intelligent so that they can become reasonably happy functioning adults in their communities. Luis Alberto Machado captured this thought best when he said, "The development of the intelligence of all people has to be the fundamental aim of our times."

Meaningfulness, indeed intelligence, can only be measured in context of the individual learner's community. For it is from community that we learn our primary language, our culture, our heritage, our values, and our hopes. This needed reunion between "natural knowledge" (a Caine term), or knowledge that can be applied in real-world situations, and classroom knowledge can best take place in context of the learners' life roles in their communities. Professionals in the various fields of education are once again beginning to take advantage of the rich random input of the community in favor of the sparse, anemic, contrived input of the classroom. Bridges are being built which recognizes the legitimacy and connectedness of both worlds. The professional educator's role can finally become that of a facilitator, broker, instructional leader, and mentor for the learner. The educator's new role becomes one of helping the learner move from dependency through independency and into interdependency with their fellow learners, the facilitator, and their community.

In Summary

To attempt to outline a new paradigm of teaching and learning, and its precepts, in one manuscript is an ambitious undertaking. But if a new model of learning and teaching, such as holosagogy, can not be outlined in a concise form it stands little chance of being understood or accepted in educational circles. Since space constraints preclude a comprehensive discussion of holosagogy, its

component parts, and its implications to the field of education this author hopes to provide a more detailed explanation at a future time.

Just as pedagogy and andragogy have had their working assumptions over the past centuries, so too is holosagogy based on specific axioms, they are: 1) irrespective of content, setting, age, culture, or delivery system all instruction must be compatible to how the human brain naturally learns, 2) each learner's preferred modalities, intelligences, and learning style elements must be assessed and accommodated, 3) patterning and meaningfulness is best achieved in context of the learner's life roles in their respective community, 4) the development of the learner's natural intelligences is the fundamental goal of education.

It is unrealistic of educators to expect earlier systems of teaching (pedagogy-1779 & andragogy-1883), translated from historic German/Prussian models of education, to adequately respond to a culturally diverse-information age based society and its educational needs. We must design a new holosagistic system, that will celebrate and accommodate for the great diversity of developmental learning patterns, both biological and environmental, of all individuals. Systems that are designed for the individual versus asking the individual learner to accommodate to the system is the future of education. Fortunately, the capability of doing just that is now possible because of advances in the biological,

neurological, and cognitive sciences.

Such an expanded understanding and vision of learning and teaching can foster the fullest development of each learner's capacity. A new theoretical framework for teaching and learning is emerging which resonates with and amplifies the very best of past models and practices. Such a system for leaders of teaching and learning might be termed holosagogy.

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